Energy, Mines and Resources Canada
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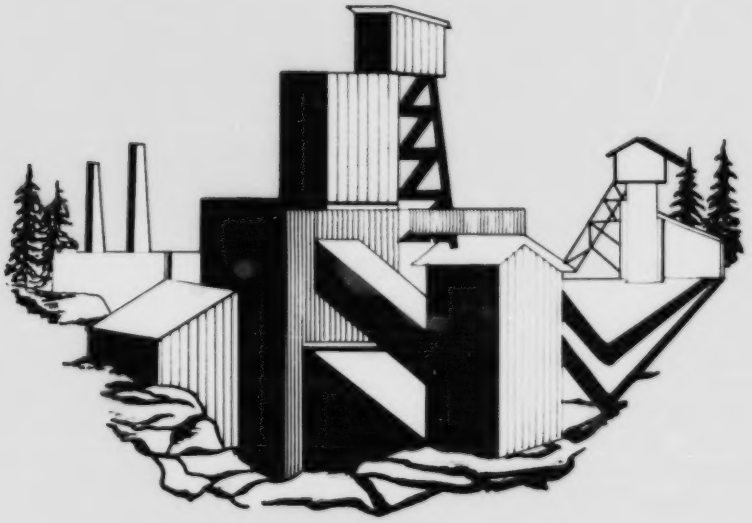
CANMET

Canada Centre for Mineral and Energy Technology
Centre canadien de la technologie des minéraux et de l'énergie

INDEX OF MINERAL PROCESSING PROJECTS

RÉPERTOIRE DE PROJETS SUR LE TRAITEMENT DES MINÉRAUX

1987



MINERAL AND ENERGY TECHNOLOGY

MINERAL SCIENCES LABORATORIES

LA TECHNOLOGIE DES MINÉRAUX ET DE L'ENERGIE

LABORATOIRES DES SCIENCES MINÉRALES

SP 88-2

Canada

INDEX OF MINERAL PROCESSING PROJECTS

RÉPERTOIRE DE PROJETS SUR LE TRAITEMENT DES MINÉRAUX

1987

W.A. Gow & N.D. Loucks

Mineral Processing Laboratory
March 1988

Laboratoire de traitement des minéraux
Mars 1988

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FOREWORD

CANMET has produced this Index of Mineral Processing Projects with the support of the Canadian Mineral Processors (CMP), a division of The Canadian Institute of Mining and Metallurgy, the Mining Association of CANADA (MAC) and the Mining Industry Technology Council of Canada Limited (MITEC). This first issue of the Index reflects the work being done in Canada in 1987 to develop new or improved technology for the mineral processing sector of the mineral industry. To ensure that the Index is timely and relevant CANMET intends to up-date it annually. Although it is the intention to include only currently active projects in the Index in the future, this first issue includes several projects recently completed but still of current general interest. CANMET and its supporting organizations expect that by making this information readily accessible, the exchange of ideas within the mineral processing community would be facilitated and this, in turn, should result in an increased level of technological achievement.

The usefulness of CANMET's Index of Mineral Processing Projects will depend, of course, on the broad participation of the industry in its preparation. This first issue of the Index contains projects from ninety-eight contributors. It is expected that as the value of the document becomes more evident, more organizations conducting mineral processing research will contribute to its development. CANMET will encourage increased participation through annual solicitation by mail, telephone contacts and site visits.

It will be observed that the Index, in addition to the source, contains a brief title for each project. Although for some projects CANMET has limited additional information on file, anyone interested in a specific project is advised to contact directly the organization concerned. In establishing the database for the Index it was not CANMET's intent to provide detailed information on projects but rather to facilitate contact between parties using the Index.

I thank all those who contributed to this first issue of the Index and look forward to their continued support in the preparation of the 1988 Index. I must also acknowledge the work of the authors of this Index and Mr. J.A. Morris of EMR's Informatics Application Division for their work in establishing the methodology and software necessary for the success of this project.

L.L. Sirois
Director
Mineral Science Laboratories

AVANT-PROPOS

CANMET a été en mesure de publier le présent Répertoire des projets du traitement des mineraux grâce au soutien fourni par la Division des Minéralurgistes du Canada de l'Institut canadien des mines et de la métallurgie (ICM), de l'Association minière du Canada (AMC), et du Conseil canadien de l'industrie sur la technologie (MITEC). Cette première édition du Répertoire reflète le travail qui a été accompli au Canada en 1987, en vue de développer des technologies nouvelles ou d'améliorer les techniques existantes au profit du secteur des opérations minéralurgiques de l'industrie minérale. En vue d'assurer la pertinence et l'actualité du Répertoire, CANMET se propose d'en faire la mise à jour annuellement. Bien qu'à l'avenir, seuls les projets en cours de réalisation figureront au Répertoire, plusieurs projets qui ont été réalisés récemment mais d'intérêt général ont été inclus dans cette publication. CANMET et ses organismes de soutien sont d'avis que la disponibilité de cette information facilitera les échanges d'idées au sein du groupe des opérations minéralurgiques, ce qui en retour, pourrait favoriser les réalisations techniques.

Il ne fait aucun doute que le Répertoire des projets du traitement des mineraux préparé par CANMET sera utile dans la mesure où l'industrie participera à sa préparation. Cette première publication du Répertoire comprend des projets présentés par quatre-vingt-dix-huit participants. On s'attend à ce que dès que l'importance du document sera reconnue, les organismes du traitement des minerais participent en plus grand nombre à sa préparation. CANMET s'efforcera de stimuler la participation en joignant les intéressés soit par le biais de lettres, de contacts téléphoniques et en organisant des visites aux installations minières.

On pourra se rendre compte que dans le Répertoire, la source est indiquée et que chaque projet est précédé d'un titre. Cependant, il peut arriver que les dossiers sur certains projets soient peu volumineux; toute personne qui désire plus de renseignements sur un projet spécifique ferait bien d'entrer en contact avec l'organisme responsable. En établissant une base de données en vue de la préparation du présent document, CANMET n'avait pas l'intention de donner une description des projets dans le détail mais plutôt de faciliter les contacts entre les personnes utilisant le Répertoire.

Je profite de l'occasion pour remercier les personnes qui ont participé à la publication de cette première édition du Répertoire et je compte sur leur collaboration future pour la préparation du Répertoire de l'année 1988.

Je désire également souligner le travail des auteurs de ce Répertoire, de même que celui de M. J.A. Morris de la Division des applications informatiques à EMR, et remercier ces personnes pour le soin qu'elles ont apporté à l'élaboration de la méthodologie et du logiciel qui étaient essentiels au succès de ce projet.

L.L. Sirois
Directeur
Laboratoires des sciences minérales

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INTRODUCTION

This first issue of the Index of Mineral Processing Technology contains 367 projects from 98 organizations. Although these projects do not represent all of the work being done in Canada to develop new and improved mineral processing technology, the list is, nevertheless, impressive and representative of the current Canadian effort.

The Index consists of two main sections. In Section One the projects are listed by organization while in Section Two they are listed under the operational categories to which they respond. The listing of the organizations in Section One is by geographical region from east to west as defined by the by-laws of the Canadian Mineral Processors. In both Sections One and Two the commodity to which a project relates is given. If a project is being done with no specific commodity in mind the term "general" is used in the commodity column.

Arranging the information contained in the Index in this way permits a person to determine readily work being done by specific performers;

(a) in a specific geographical region;
(b) on a specific commodity;
(c) on a specific operational category;
(d) on any combination of the above.

The project titles are described in whichever of the two official languages they were received. Consequently in searching for work on a specific commodity both the English and French words for that commodity must be used as identifiers. The most common of these combinations are gold/or, copper/cuivre, iron ore/min. de fer, and lead/plomb.

Contributors to the Index of Mineral Processing Technology by so doing have indicated a willingness to discuss their work with other interested parties. The mineral processing community at large is urged to take advantage of this willingness and thus open valuable new lines of communication. In Section One a contact for each organization is given to the right of the organization's name. In some cases, other contacts are listed immediately ahead of the projects for which they are responsible.

INTRODUCTION

Cette première édition de Répertoire des techniques du traitement des minéraux fait état de 367 projets présentés par 98 organismes. Ces projets ne représentent qu'une partie des activités effectuées au pays en vue de développer de nouvelles technologies ou d'améliorer les techniques minéralurgiques existantes. La liste en est tout de même impressionnante et témoigne des efforts qui se font actuellement au Canada.

Le Répertoire comprend deux sections principales. Dans la première section, les projets sont présentés en fonction des organismes tandis que dans la deuxième section, ils sont classés d'après la catégorie opérationnelle à laquelle ils correspondent. La liste des organismes est présentée dans la première section selon les régions géographiques, de l'est à l'ouest, conformément aux règlements de la Division des Minéralurgistes du Canada. Dans les sections I et II, le produit de base auquel se rattache le projet est indiqué. Si un projet ne porte sur aucun produit de base spécifique, le terme - général - est inscrit dans la colonne où figurent les produits de base. La disposition de l'information dans le répertoire permet à une personne d'obtenir les renseignements suivants sur les travaux exécutés par certains entrepreneurs en particulier;

(a) le région géographique particulière;
(b) le produit de base spécifique;
(c) la catégorie opérationnelle déterminée;
(d) toute combinaison des sujets susmentionnés.

Les titres des projets sont présentés dans la langue officielle dans laquelle ils ont été rédigés. Par conséquent, quand il s'agit de repérer la documentation se rattachant à un produit de base spécifique, les termes français et anglais indiquant le produit doivent être utilisés pour les identifier. Les combinaisons les plus fréquentes sont; or/gold, cuivre/copper, min. de fer/iron ore, et plomb/lead.

Les personnes qui ont participé à la publication du Répertoire des techniques du traitement des mineraux ont démontré une volonté de discuter de leurs travaux avec d'autres parti(e)s intéressé(e)s. Tous ceux et celles qui sont intéressé(e)s au traitement des mineraux devraient s'empresser de tirer profit de ces conditions favorables et de contribuer ainsi à créer de nouvelles voies de communication. Dans la section I, les noms des représentants figurent à la droite des organismes qu'ils représentent. Dans certains cas, les noms d'autres personnes, précèdent immédiatement les titres des projets dont elles sont responsables.

SECTION ONE - Projects Listed by Organization

SECTION UN - Liste des Projet par Organization

Atlantic Coal Institute
P.O. Box 1594
Sydney, Nova Scotia
B1P 6R8

Dr. W. Dieter Birk
Executive Director
(902)539-2800

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
Dr. C. Francis		
1. Bacterial leaching re:precious metal recovery and coal desulphurization.	10,15	gold/coal
D. Anderson		
2. Computer process simulation of mineral processing facilities using ASPEN software.	2,14	general
G. Campbell		
3. Feasibility study of Eastern Canadian coal conversion via IGCC technology.	2,14	coal
J.C. White		
4. Bench scale beneficiation tests of New Brunswick oil shale.	3,4,5,6,7,8	oil

Cape Breton Development Corporation
P.O. Box 2500
Sydney, Nova Scotia
B1P 6K9

Greg Landry
Process Engineer
(902)564-2594

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Production of high solids content coal slurry (coal water fuel,CWF) for direct firing/combustion.	4,5,6,11,13 14	coal
J.C. Campbell (902) 564-2894		
2. Bacterial oxidation of methane released from mined coal.	16	coal
B. Clyburn (902) 564-2889		
3. Application of statistical process control (SPA) in coal preparation.	1,14	coal
4. Computerized planned maintenance.	1	general
5. Heavy media cyclone operation at S.G lower than 1.3.	8	coal
6. Freeze-proofing coal products with side release agents.	16	coal
7. Optimizing rotary breaker performance.	3	coal

Dept. Natural Resources-Energy-New Brunswick
P.O. Box 6000
Fredericton, New Brunswick
E3B 5H1

J. Dean Thibault
Process Chemical Engineer
(506)453-2206

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Optimization of grade and recovery at Durham Antimony mine by improving grinding circuit operation.	4,6	antimony
2. Further processing of antimony concentrates.	2,9,10,16	antimony
3. Mineralogical study and heap leaching of New Brunswick precious metal ores.	1,10	gold/silver
4. Characterization and recovery of the less common metals from New Brunswick ores and tailings	2,7,8,9,10 16	general
5. Benefication of complex sulphide ores to make bulk concentrates for ferric chloride leaching	2,4,6,9,10	Zn,Pb,Cu
6. Investigation of process options for Mount Pleasant Tungsten ores.	2,4,6,7,8,9 10	W,Sn,Mo
7. Process development for industrial minerals.	3,4,6,7,8,9	ind. min.

Denison-Potacan Potash Company
P.O. Box 5005
Sussex, New Brunswick
E0E 1P0

Ivan N. Duke
General Manager
(506)839-2146

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Potash coarse rougher flotation.	6	potash
2. Optimization of compaction of fine potash products.	13	potash
3. Potash tailings backfill and consolidation.	15	potash

Dominion Explorers Inc.- Durham Mines Div.
York County
Prince William, New Brunswick
E0H 1S0

Victor F. Hendricken
Mill Superintendent
(506)454-9761

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Infrared drying of antimony sulphide.	12	antimony
2. Coarse flotation of antimony sulphide from the recirculating stream of the secondary grinding circuit.	6	antimony

Gordex Minerals Limited
P.O. Box 7071, Station A
Saint John, New Brunswick
E2L 4S5

H.E. Pavson
President, and C.E.O.
(506)633-2088

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Development of vat leaching technology for application in the New Brunswick climate.	2,10	gold

Seabright Resources Inc.
R.R.#1 Millford Station
Hants County, Nova Scotia
BON 1YO

E.W. Thornton
Mill Superintendent
(902)758-3313

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Expansion and process development of a custom gold mill using gravity and flotation.	2	gold

Dept. of Mines
95 Bonaventure Avenue
St. John's, Newfoundland
A1C-5T7

Ferd Morrissey
(709)576-2773

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
	Dr. J.A. Soles (613) 996-8394		
1.	Assessment of the alkali reactivity of potential concrete aggregates of Newfoundland.	2	concrete
	J.M.D. Wilson (613) 992-1394		
2.	Assessment of binders for pelletizing iron ore.	2,12	iron ore
	M. Stefanski (613) 996-5046		
3.	Studies to improve iron ore recovery at the Scully Mine.	6,8	iron ore
	Dr. D.J. MacKinnon (613)995-4851		
4.	Copper recovery and cyanide regeneration for use at Hope Brook gold property.	10	gold, copper

Magstone Development Inc.
9 Fundy Drive
Truro, Nova Scotia
B2N-5Y2

R.K. Collings
Research Scientist
(613)992-3806

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Preparation and evaluation of selected Nova Scotia industrial minerals as fillers and extenders.	6,7,8,10	ind. min.

Technical University of Nova Scotia
Metallurgical Laboratory
Halifax, Nova Scotia
B3J-2X4

Prof. L.A. Adorjan
Head, Metallurgical Labs.
(402)429-8300

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Gravity separation of Pine Brook barite for recovery of mud-grade product.	3,5,8	barite

Wabush Mines
P.O. Box 3000
Wabush, Nfld
AOR 1BO

R. Ross
Mill Superintendent
(709)285-7277

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Regrind of spiral middlings.	8	iron ore
2. Spiral feed density control.	14	iron ore
3. Tailings line velocity control.	14	iron ore

La Compagnie Minière Québec Cartier
Mount Wright, Québec
G0G-1J0

Christian Côté
Chef de section métallurgie
(418)287-5641

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Efficacité des spirales pour la récupération du fer en divisant l'alimentation régulière en deux parties: fine et grossière.	8	min de fer
2.	Criblage des mixtes recirculés au broyeur pour éviter le surbroyage de la partie fine des mixtes.	4,5,	min de fer

BP Minerals - Selbaie Mines
P.O. Box 370
Joutel, Quebéc
JOY-1NO

Pierre Lacombe
Flotation Metallurgist
(819)756-2491

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Talc/chlorite depression in sulfide flotation.	6	copper,zinc
2.	Alternatives for a selective copper sulfide collector.	6	copper
3.	Use of Eh to improve selectivity and predict ore type changes.	6	copper

Minerais Lac Ltée - Div. Est-Malartic
C.P. 1150
Malartic, Québec
J0Y-1Z0

M. Lanouette, P. Jean

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Traveaux pour déterminer les critères d'utilisation de la thiourée.	10	or
2. Contrôle en continu des valeurs aurifères.	14	or

Mines D'or Lac Bachelor Inc
Desmaraisville,, Québec
JOY-1HO

Benoit St. Pierre
Directeur
(819)753-2521

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Echantillonnage systématique pour le minerai concassé à la discharge du concasseur secondaire.	3,14	or

Mines D'or Val
C.P. 1270
Val D'or, Québec
J9P-4P8

Pierre Filteau
Surintendant du concentrateur
(819)736-4511

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Optimisation de la récupération de l'or par la cyanuration et la récupération de l'or natif.	16	or

Les Mines Northgate Inc
C.P. 8000
Chibougamau, Québec
G8P-2L1

Tshitende Kasongo
Surintendant du concentrateur
(418)748-7691

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Optimisation de la récupération de l'or par gravité, par flottation et par la cyanuration des rejets.	6,8,10	or

Les Mines Sigma (Québec) Ltée
Val D'or, Quebec
J9P-4N8

Jean-Guy St-Jean
Mill Superintendent
(819)824-9897

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Re-design of grinding circuit.	4	gold

Minnova Inc/Div. Lac Dufault
C.P. 2000
Noranda, Québec
J9X-5B4

Pierre Pelletier
Surintendant du concentrateur
(819)797-2501

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Flottation d'un minérais réfractaire de Cu/Zn contenant principalement de la pyrite (près de 90%) (Projet Mobrun).	6	cuivre,zinc
2.	Flottation d'un minérais de sulfure massif de Cu contenant principalement de la pyrhotine (Projet Ansil).	6	cuivre

Minnova Inc/Div. Lac Shortt
C.P. 539
Chapais, Québec
G0W-1H0

Hassan Zouit
Chef métallurgiste
(819)753-2571

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Grinding circuit mass balance.	4	gold
2. Ball size optimization.	4	gold
3. Gravity separation.	8	gold
4. Pyrite flotation and cyanidation.	6,11	gold
5. Fine particle cyanidation.	10	gold
6. Process control.	14	gold
7. Tailing management-cyanide destruction.	15	gold
8. Performance of carbon stripping.	16	gold

Noranda Minerals Inc.
Matagami Division
Matagami, Québec
JOY-2AO

Brian Arsenault
Concentrator Superintendent
(819)739-2511

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Crusher dust collection improvements.	3	copper,zinc
2. Flotation cell rebuild.	6	copper,zinc
3. Process computer installations.	14	copper,zinc
4. Gondola car-cover handling crane.	13	copper,zinc

Les Ressources Camchib Inc.
C.P 3400
Chibougamau, Québec
J0Y-1N0

Jacques Leclair
Assistant Surintendant
(418)748-2625

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Cyanuration du matériel de remblai.	10	or
2. Flash flottation.	6	or
3. Circuit de broyage en série.	4	or

Les Mines Selbaie
C.P. 370
Joutel, Québec
JOY-1NO

Ron Murarka
Production Metallurgist
(819)756-2491

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Grinding circuit control.	4,14	gold
2. Grinding media evaluation.	4	gold

CANMET
555 Booth street
Ottawa, Ontario
K1A-0G1

Dr. Henry Steger
Manager-Chemical Laboratory
(613)992-4105

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
J.C. Hole (613) 995-4775		
1. The development of nev and improved methods for analysing mineral processing and metallurgical products.	14	general
Dr. C.W. Smith (613) 992-1055		
2. The preparation of certified samples of ores, concentrates, metals and related materials.	14	general

CANMET
555 Booth Street
Ottawa,, Ontario
K1A-0G1

M.C. Campbell
Manager-Extractive Metallurgy
(613)996-2929

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. The development and evaluation of a chloride metallurgical process for the treatment of bulk sulphide concentrates.	10	Cu,Pb,Zn,Ag
2. The development of improved technologies for the characterization, disposition and control of impurities in electrolytic copper refining.	10,14	copper
3. The development of applications for plasma technology as an energy source in pyro-metallurgy.	16	copper
4. The determination of the characteristics of acid producing sulphide tailings and assessment of current management techniques.	15	sulphur
5. The development, evaluation and comparison of technologies for recovering or destroying cyanide in gold mill effluents.	15	gold
6. The characterization of metallurgical sludge stability in disposal systems.	15	general
7. The characterization of the properties of metal-As-O systems and the development of a solid state sulphur probe. Dr. R. McCreedy (613) 992-1596	14,16	arsenic,S
8. The identification , quantifying, testing and application of biological phenomena in the mineral and fossil fuels industries.	6,10,14,15	general

cont.

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
G.M. Ritcey (613) 995-4124		
9. The optimization of a pressure leaching process to solubilise radium when leaching uranium ores.	10	uranium
10. The development of new or improved processes to increase recovery and reduce costs in treating gold ores.	8,10,16	gold
11. The development of a process for recovering platium group metals from a Canadian ore.	10,16	platium
12. The development of technology for the recovery and purification of lanthanides and associated metals from a Canadian ore.	10,16	rare earths
Dr. A.H. Webster (613) 995-4641		
13. To elucidate the behaviour of silver in conventional zinc plants nd the development of new technology to improve silver recovery.	10,15,16	silver, zinc
14. To develop technology to reduce the loss of values to slags and increase the rejection of impurities in smelting.	16	Ni, Cu,Co,Ag

CANMET
405 Rochester Street
Ottawa, Ontario
K1A-0G1

Frank Campbell
Manager, Mineral Processing
(613)996-5619

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Identification of technology for use by the industrial mineral industry to reduce energy consumption.	4,5,14	ind. min.
D.M. Doyle (613) 992-7782		
2. A study of the potential for heap leaching of placer deposits in the Yukon.	10	gold
3. Optimization of unit operations used in placer mining.	8,11,13,15	gold
4. Studies related to asbestos - wet milling, characterization of fibres and bore hole analysis.	9,16	asbestos
D.G. Feasby (613) 992-8794		
5. Studies related to the potash industry- dry magnetic and heavy media separation, tailings management and degradation in transit.	potash	7,8,13,15
6. Preparation of a manual on the disposal of tailings from uranium mining operations.	15	uranium
7. Production of barium chemicals from barite.	16	barite
W.H. Cameron (613) 992-1123		
8. Development of a method for predicting concentrator performance from characteristics of blast hole cuttings.	16	iron ore

cont.

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
9. Development of methods to increase fine iron recovery from Wabush/Scully tailings.	16	iron ore
Dr. M. Stefanski (613) 996-5046		
10. Development of a method for controlling moisture content of concentrates produced at Quebec Cartier Mining Company.	12	iron ore
A.I. Stemerowicz (613) 992-5860		
11. Beneficiation of complex and refractory ores.	6	Cu,Pb,Zn
Dr. D. Laguitton (613) 996-7953		
12. Process control and development of expert systems for an oil sands extraction plant.	14	oil sands
13. Development of expert systems for use in a flo tation plant computer control scheme.	14	general
Dr. W. Petruk (613) 992-1376		
14. Correlation of mineral liberation to ore characteristics and grinding methods.	4,6,	general

cont.

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
Dr. P. Mainwaring (613) 992-1392		
15. Mineralogical evaluation of ores.	16	general
Mr. M.A. Cristovici (613) 992-6430		
16. Improved recovery technology for the treatment of fine particles.	9	general
Mr. R.K. Collings (613) 992-3806		
17. Sandstone reduction by attritor grinding.	3,4,	silica
18. Summary reports, industrial minerals.	16	ind. min.
Mr. T. Cienski (613) 992-5167		
19. Optimization of column flotation.	6	general
20. Recovery of fine placer gold from sluice box tailings.	8	gold
Mr. J.M.D. Wilson (613) 992-1394		
21. Image analysis study of products from various parts of the Quebec Cartier Mining Company spiral circuit.	8	iron ore
Dr. D. Quon (613) 992-2205		
22. Production of cold bonded pellets.	16	iron ore
Dr. S. Wang (613) 992-1390		
23. Study to determine reducibility of iron ore pellets.	16	iron

Centre de Recherches Minérales
2700 rue Einstein
Ste. Foy,, Québec
G1P-3W8

M. Marc Pichette
Directeur/l'analyse minérale
(418)643-4540

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Rendement d'un test de concentration du minerai du lac Rose.	16	or
2.	Minéragraphie de l'or dans sept échantillons de la propriété Dalembert.	16	or
3.	Nature de l'or dans un composé de rejet.	16	or
4.	Etude minéralogique d'un précipité de zinc.	16	zinc
5.	Les associations minéralogiques de l'or et chalcopyrite dans un minerai de sulfur massif.	16	or,cuivre
6.	Minéragraphie de l'or: projet Porcupine.	16	or/arsenic
7.	Minéragraphie du l'or de la propriété Mouska.	16	or
8.	Étude d'un minerai de cuivre-or.	16	or,cuivre

MONTREAL / MONTRÉAL

Centre de Recherches Minérales
2700 rue Einstein
Ste. Foy, Québec
G1P-3W8

M. Alain Claveau
Directeur, Métallurgie

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Flottation du pyrochlore à l'aide de réactifs chélatants.	6	niobium
2.	Evaluation de diverses méthodes de mesure de l'indice de broyabilité d'un minerai.	4	general
3.	Techniques et équipements pour le développement des minéreaux industriels de haute valeur.	16	ind. min
4.	Inventaire de gisements de minéraux industriels du Québec.	16	ind. min.
5.	Diagnostic d'opération de quatre usines de traitement des minerais d'or de l'Abitibi-Témiscamingue.	2	or
6.	Bouletage de fines de mica.		mica
7.	Essais standard d'évaluation des charges minérales utlisées dans les secteurs des pâte et papiers et des plastiques.	16	ind. min.
8.	Évaluation des techniques prometteuses pour le traitement chimique des surfaces des minéraux industriels.	16	ind. min.
9.	Développement d'une méthode de mesure du collage du minerai de fer lors de la réduction directe.	12	min de fer
10.	Développement d'un essai de simulation de la technique d'agglomeration (sintering) du minerai de fer.	12	min de fer

cont.

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
11.	Dimensionnement des circuits industriels de flottation.	6,14	general

MONTREAL / MONTRÉAL

Centre Spécialisé en Technologie Minérale
671 Boul. Smith Sud
Thetford Mines, Québec
G6G-1N1

M. Réjean Nadeau
Directeur

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Augmenter la qualité de la fibre d'amiante en utilisant un contrôle automatique.	14	amiante

Chromasco
Division of Timminco Limited
Haley, Ontario
K0J-1Y0

Russel E. Etienne
Chief Engineer
(613)432-3621

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	MacRae celestite Loch Lomond, Cape Breton. Concentrate and conversion to strontium carbonate.	6,16	celestite

Cominco Metals
Polaris Mine
Polaris, N.W.T.
X0A-0Y0

M.R. Freiberg
Concentrator Superintendent
(819)253-2230

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. The development of an expert system to control the Polaris Mine flotation circuit.	6,14	lead/zinc
2. Column flotation application for coarse lead.	6	lead/zinc
3. Column flotation applied to zinc cleaning.	6	zinc

Développement Minier Aurtec Inc
233 Champagne
St-Eustache, Québec
J7P-2H2

Jean Claude Caron
Président
(514)473-6910

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Lixiviation en tas des tailings de Montauban.	10	or

Graphite Asbury Québec Inc.
C.P 100
Notre-Dame du Laus, Québec
J0X-2M0

Marcel Duchesne
Surintendant du moulin
(819)767-2221

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Étude pour nouvel emplacement d'un parc à rejet.	15	graphite

Université Laval
Dept. Mines et Métallurgie
Québec, Québec
G1K-7P4

Dr. Daniel Hodouin
Professeur
(819)656-5003

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Bilans minéralurgiques.	14	général
2. Simulation du procédé CEP.	10,14	or
3. Simulation et contrôle de la cyanuration.	10,14	or
4. Simulation et contrôle de la cuisson des boulettes de concentré defer.	12,14	min de fer
5. Contrôle du broyage.	4,14	général
6. Contrôle de la flottation.	6,14	général
7. Systèmes experts.	14	général
8. Modélisation des procédés dynamiques.	14	général

Linatex Canada Inc
5235 Henri Bourassa West
Montreal, Québec
H4R-1B8

D. Mingie-Cahill
Senior Process Engineer
(514)334-0252

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Fine hydrocycloning.	5	general
2. Coarse hydrocycloning.	5	general

McGill University
Mining & Metallurgical Engineering
Montreal, Quebec
H3A-2A7

Dr. James A. Finch
Professor
(514)398-4365

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Column flotation, testing/scale up in.	6	general
2. Column flotation, basic studies in.	6	general
3. Column flotation, control measurements in.	6,14	general
4. Magnetic hydrocyclones, dense media recovery in.	7,8	general
5. Image analysis on Zn plant wastes.	16	general
6. Electrochemistry of sulphide flotation, basic study in.	6	general
7. Fe/Zn separation using N_2 flotation of pyrite.	6	zinc
8. Zn activation with metal hydroxides.	6	zinc
9. Electrodes for pulp potential.	6	general
10. Recycle water treatment, microbiological and physical adsorption in.	6	general

Nanisivik Mines Limited
P.O. Box 225
Nanisivik, N.W.T.
X0A-0X0

John Goyman
Mill Superintendent
(819)436-7472

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Improving metal recoveries of partly oxidized sulphide ores using organic reagents.	6	zinc/lead

Les Services T.M.G. Inc. (Mine Niobec)
3400 Chemin du Columbium
St-Honoré, Québec
G0V-1L0

Rudy Biss
Recherche et Développement
(418)673-4694

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Récupération du pyrochlore noir et de la colombite.	6	niobium
2. Flottation des carbonates par d'autres collecteurs que les acides gras,	6	niobium
3. Amélioration de la qualité de l'eau recyclée.	6,15	niobium
4. Flottation du pyrochlore déschlammé à 3-5 um.	6	niobium

Noranda Research Centre
240 Hymus Blvd.
Pointe Claire, Québec
H9R-1G5

Ken Stowe
Program Mgr.- Min. Processing
(514)697-6640

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Instrumentation for milling operations.	14	general
2. Water management in Noranda Group mills.	15	general
3. Mineral process development.	6,8	general
4. Evaluation of the Point Leamington Deposit Phase II.	2	iron ore
5. Mill control implementation.	14	general
6. Advanced process control and modelling.	14	general
7. Development of a small scale continuous flotation cell.	6	general
8. Grinding circuit investigations.	4,5,	general
9. Improved mill wear materials.	3,4,13	general

Canada Cement Lafarge Limited
6150 Royalmount
Montreal, Québec
H4P-3R2

R. Johnson
Manager of Government Affairs
(514)738-1202

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Coal tailings oil agglomeration study.	16	coal

Giant Yellowknife Mines/Timmins Operations
P.O. Bag 2010
Timmins,, Ontario
P4N-7X7

Ernie Marcotte
Area Metallurgical Supt.
(705)267-1141

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Large scale heap leaching of low grade gold ore.	10	gold

Lac Minerals Ltd./Macassa Division
P.O. Box 550
Kirkland Lake,, Ontario
P2N-3V7

Hans de Ruiter
Area Engineer
(705)567-5208

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Construction of new mill to handle mine ore and reclaimed tailings.	2	gold

Agnico Eagle Mines Ltd./Silver Division
P.O. Bag 140
Cobalt, Ontario
P0J-1C0

Bill Montgomery
Mill Superintendent
(705)679-8678

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Crushing.	3	silver
2. Grinding.	4	silver
3. Sizing.	5	silver
4. Flotation.	6	silver
5. Gravity and heavy media separation.	8	silver

CENTRAL ONTARIO / CENTRE de L'ONTARIO

Laurentian University
Ramsey Lake Road
Sudbury, Ontario
P3E-2C6

Dr. G.E. Goldsack
Dean, School of Engineering
(705)675-1151

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
	Dr. M.A. Alikham		
1.	The use of aquatic animals to monitor and quantify metal environmental contaminants.	15	general
	Dr. W. Dresler		
2.	Extraction of FeCr from Bird River, Manitoba chromite deposits.	10	chromite
3.	Amine flotation of low grade North Americian chromite ores.	6	chromite
	Dr. I. Reilly		
4.	Hydrometallurgical production of pigment grade zinc oxide.	10,16	zinc
	Dr. Y.A. Sadana		
5.	Leaching of low-grade minerals with subsequent electrolytic precipitation.	10,16	zinc
6.	Mineral flotation with organic liquids and correlation of effect with molecular structure.	6	general
	Dr. T. Yalcin		
7.	Rapid dewatering of tailings.	15	general

cont.

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
8.	Sedimentation characteristics of Cu/Ni mill tailings and thickener size estimation.	11	general

CENTRAL ONTARIO / CENTRE de L'ONTARIO

Denison Mines Ltd.
P.O. Box 2600
Elliot Lake, Ontario
P5A-2K2

S. Keller
Superintendent, Ind. Eng.
(705)461-6445

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Large scale underground testing of bacterially assisted leaching methods.	10	uranium

Falconbridge Limited/Strathcona Mill
Sudbury Operations
Onaping, Ontario
POM-2RO

Brent Chertow
Mill Superintendent
(705)966-3411

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Column flotation.	6,14	nickel,Cu
2.	Slurry densification and transportation.	13,11	nickel, Cu
3.	Grinding circuit automation.	4,5,14	nickel,Cu
4.	Crushing plant modernization/automation.	3,13,14	nickel,Cu
5.	Distributed process control system.	14	nickel,Cu
6.	Separate copper ore processing.	2	copper
7.	Classified tailings system.	15	general
8.	Fine ore feeder automation.	13,14	general
9.	Pyrrhotite/pentlandite (Po/Pn) separation.	5,6,7	nickel
10.	Retrofit of computer control system.	14	nickel,Cu
11.	Flotation blower rationalization.	6,14	general

CENTRAL ONTARIO / CENTRE de L'ONTARIO

Rio Algom Ltd.
P.O. Box 1500
Elliot Lake, Ontario
P5A-2K1

Biman Bihari
Head, Process Dev. Dept.
(705)461-4457

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Bacterial leaching of uranium ores.	10	uranium
2. Leach acid control.	14	uranium
3. On-stream uranium analysis.	14	uranium
4. Mill tailings management to control and minimize environmental effects.	15	uranium
5. Product purity, thorium elimination.	10	uranium

Rio Algom Limited/Quirke Mill
P.O. Box 1500
Elliot Lake, Ontario
P5A-2K1

Doug Horne
Mill Superintendent
(705)461-4217

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Testing ceramic tiled, conveyor skirting applications.	13	general
2. Automating crusher house feed rate controls.	3,14	general
3. Installation of a distributed control instrumentation package.	14	general
4. Control of fixed bed ion exchange by on-stream analysis of barren streams.	14	general

B.P. Resources, Mining Division
Suite 1700, 55 University Avenue
Toronto, Ontario
M5J-2H7

Godfrey McDonald
Assistant General Manager
(416)361-0794

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Copper ion removal from gold process solutions.	10	gold, copper
2.	Cyanide regeneration from gold process solutions.	10	gold
3.	Coal/oil agglomeration of precious metals and/or sulphides.	9	general
4.	Abrasion - how to reduce the cost?	16	general

Environment Canada/Wastewater Technology
P.O. Box 5050, Physical Chemical Process Sec.
Burlington, Ontario
L7R-4A6

J.W. Schmidt
Section Head
(416)336-4541

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Gold mining effluent treatment.	15	gold
2. Treatment of aqueous effluents from in-situ bitumen heavy oil recovery.	15	oil

Heath & Sherwood (1964) Limited
187 Steelcase Road, West, Unit 4
Markham, Ontario
L3R-2R9

P. Aimone
Product manager
(416)475-5236

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Particle size analyser.	14	general
2. Pulp density monitor.	14	general

Inco Limited
J. Roy Gordon Research Center
Mississauga, Ontario
L5K-1Z9

Dr. Gordon E. Agar
Section Head
(416)822-3322

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Flotation, pyrrhotite reduction.	6	nickel
2. Liquid/solid separation, nickel concentrate filtration.	11	nickel
3. Gold recovery, jigging.	8	gold
4. Gold recovery, flotation.	6	gold
5. Grinding, mill rationalization.	6	nickel, Cu

University of Toronto
Dept. of Metallurgy & Materials Science
Toronto, Ontario
M5S-1A4

Dr. Glenn Dobby
Assistant Professor
(416)978-3017

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Aerosol reagent addition in column flotation.	6	general
2. Column flotation, column simulator.	6	general
3. Column flotation, froth performance analysis.	6	general
4. Column flotation, interface sensing.	6	general
5. Particle collection physics.	6,14	general
6. Characterizing and cleaning of zinc concentrates.	6	zinc
7. Mixing conditions in high gradient magnetic separators.	7	general

University of Waterloo
Department of Chemical Engineering
Waterloo, Ontario
N2L-3G1

Dr. Peter L. Douglas
Associate Professor
(519)885-1211

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Biological leaching of uranium ore.	10,14	uranium

Waterloo Centre for Process Development
University of Waterloo
Waterloo, Ontario
N2L-3G1

Dr. D. R. Spink
Professor
(519)885-1211

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Application of partial desulfurization roasting to the extractive metallurgy of zinc.	10,11,16	zinc

EIMCO Process Equipment
5155 Creekbank Road
Mississauga, Ontario
L4W-1X2

W.W. Stone
Regional Manager
(416)625-6070

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Bio-oxidation of refractory ores.	10	general

Zenon Environmental Inc.
845 Harrington Court
Burlington, Ontario
L7N-3P3

R. Philip Canning
Manager, Process Engineering
(416)639-6320

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Membrane processing of oil-field produced water for enhanced oil recovery for steam generation.	9	oil

Minnova Inc., Winston Lake Division
P.O. Bag No. 2
Schreiber, Ontario
P0T-2S0

Wayne Fong
Production Metallurgist
(807)824-3368

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Metallurgical performance of the Winston Lake mill.	2,16	zinc, Cu

Noranda Minerals Inc., Geco Division
P.O. Box 100
Manitouwadge, Ontario
P0T-2C0

Susan Sawyer-Beaulieu
Project Metallurgist
(807)826-3211

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Concentrate dewatering, control and automation	11	Zn,Pb,Cu
C. Ferron (807) 826-3211		
2. Heavy media separation pilot plant test on GECO ore.	8	Zn,Pb,Cu
3. Flotation test replacement project.	6	Zn,Pb,Cu
Mr. Rod Clement (807) 826 3211		
4. Manpower training, work safety, milling specialities.	1	general

Lakehead University
School of Engineering
Thunder Bay, Ontario
P7B-5E1

Dr. I. Nirdosh
Professor of Chemical Eng.
(803)343-8343

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Processes for obtaining environmentally safe uranium mill tailings.	10	uranium

Dickenson Mines
Sullivan Joint Venture
Balmertown, Ontario
POV-1CO

S. Wojtaszek
Laboratory Technician
(807)735-2077

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. C.I.P. scavenging circuit.	2,10	gold

Placer Dome Inc.,Campbell Red Lake Mine
P.O. Box 10
Balmertown, Ontario

T.S. Harvey
Metallurgist
(807)735-2075

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Attrition milling of calcine residues.	4	gold
2. Airless reverse flow (A.R.F.) carbon retention screens.	10	gold

Inco Limited
Manitoba Division
Thompson, Manitoba
R8N-1P3

D.M. Shefford
Manager, Process Technology
(204)677-5211

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Sulphur dioxide reduction, pyrrhotite rejection.	6	nickel

Hudson Bay Mining and Smelting,Ruttan Mine
P.O. Box 1000
Leaf Rapids, Manitoba
ROB-1WO

Chris B. Webber
Mill Superintendent
(204)473-2415

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Column flotation.	6	Zn,Cu
2. Flotation process control.	14	Zn,Cu

Hudson Bay Mining and Smelting
P.O. Box 1500
Flin Flon, Manitoba
R8A-1N9

J.A. Hillier
Mill Superintendent, Flin Flon
(204)687-2265

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Namew Lake mill, new Cu,Ni mine and mill.	2	nickel, Cu
2. Flash flotation cell.	4,6	gold
3. Crusher automation.	3	Zn,Cu,Au
Mr. B. Barlin (204) 687 2317		
4. Flin Flon mill modernization, flotation circuit.	2,6	Zn,Cu,Au
5. Trout Lake ore metallurgy.	2,6,16	Zn,Cu, Au
6. Bacterial leaching of Flin Flon ore.	10	Zn,Cu,Au

Manitoba Department of Energy and Mines
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C-4E3

W.A. Bardswich
Director of Mines
(204)945-6505

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
Mr. David C. Cook (204) 945-0491		
1. Study on abandoned sulphide tailings.	15	general
2. Study of the effect of particle shape on gravity table concentration.	8	ind. min.
3. GCM iron chloride process for leaching of copper sulphides.	10	copper
4. Recovery of gold and silver from zinc pressure leach residue.	10	gold,silver
5. Recovery of base and precious metals from oxide residue from zinc fuming plant.	10	Zn,Pb,Cu,Au
6. Feasibility study, gold processing mill, Snow Lake area.	2	gold
7. Industrial minerals survey.	16	ind. min.
8. Energy and materials conservation in concrete manufacture and mine backfill.	16	concrete
9. Mineral processing and economic evaluation of the Bird River chromite deposit.	2	chromium
10. Upgrading of feldspar.	6,8	feldspar

Central Canada Potash, Div. of Noranda Mines
P.O. Box 1500
Colonsay, Saskatchevan
S7K-5J4

Emile J. Brokx
Mill Superintendent
(306)944-2170

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. HMS of potash using tri flow separator.	8	potash
2. Dry magnetic separation of clay from potash ore.	7	potash
3. Modification of magnetic properties of NaCl and KCl.	7	potash
4. Computerized process control.	14	potash
5. Management of tailings piles.	15	potash
6. Energy conservation in drying and crystalising.	16	potash

Cominco Fertilizers
Engineering and Technical Development
Vanscoy, Saskatchevan
S0L-3J0

D.A. Cormode
Superintendent
(306)668-4343

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Dense media separation of potash ore using tri flo dense media separation phase 1 study.	8	potash
2. Dense media separation of potash ore using tri flo dense media separation phase II study.	8	potash

Eldor Mines
P.O. Box 2070
Saskatoon, Saskatchewan
S7K-3S7

Wolfgang W. Milde
Mill Superintendent
(306)633-2141

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. New SX plant.	2	uranium
2. Rubber lining auto mill.	4	uranium
3. Computer model for water balance.	14	uranium

Melis Engineering Ltd.
519 - 45th Street West
Saskatoon, Saskatchewan
S7L-5Z9

Lawrence A. Melis
President
(306)652-4084

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Mill commissioning systems.	1,2,14	general

Potash Corporation of Saskatchevan
Suite 500, 122-1st Avenue South
Saskatoon, Saskatchevan
S7K-7G3

D.K. Storer
Manager, Process Development
(306)933-8532

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. K40 instrumentation.	14	potash
2. Slimes separation.	11	potash
3. Magnetic separation.	7	potash
4. Electro-coagulation.	11	potash
5. Column flotation.	6	potash
6. Process development - potassium sulphate.	2	potash
7. Process development, potassium phosphate.	2	potash
8. Electrostatic separation.	9	potash
9. Compaction of potash fines.	5,12	potash
10. Product quality.	16	potash
11. Crystallization.	10,14	potash
12. Low temperature crystallization.	10	potash
13. Automatic particle size analyser.	14	potash

Echo Bay Mines Limited
Lupin Mine
Lupin, N.W.T.
X0E-1M0

P. Parashyniak
Mill Superintendent
(403)429-8767

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Training of operators.	1	general
2. Improve the crushing circuit.	3	gold
3. Optimization of grinding circuit.	4	gold
4. Modelling the cyclones.	5	gold
5. R&D: concentration of gold in tailings by flotation.	6	gold
6. Reduce reagent consumption.	10	gold
7. Process control of all circuits in the mill.	14	gold
8. Tailings treatment and control.	15	gold
9. R&D: Reducing power as cyanide consumption monitor.	16	gold

Luscar Sterco (1977) Ltd.
P.O. Box 5000
Edson, Alberta
T0E-0P0

Morris Ennis
Plant Manager
(403)794-8112

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Flotation of fine coal.	6	coal
2. Study of Mineral Deposit's new LD4 spiral for separation of fine coal.	9	coal
3. Testing of electro-coagulation on our thickener water.	11	coal

Alberta Research Council, Coal & Hydrocarbon
P.O. Bag 1310, Devon Coal Research Center
Devon, Alberta
T0C-1E0

Al Turak
Project Manager
(403)987-8123

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Integrated agglomeration test facility (IATF).	4,5,6,9,12 13,14,16	coal
2.	Development of AGFLOTHERM process for coal, beneficiation and coal heavy oil co-processing.	4,5,6,9,13 14,16	coal,oil

Giant Yellowknife Mines Ltd., Yellowknife Ops
P.O. Bag 3000
Yellowknife, N.W.T.
X1A-2M2

T.R. Raponi
Mill Metallurgist
(403)873-6301

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Tailings retreatment plant.	15	gold
2. Arsenic recovery.	16	arsenic

Syncrude Canada Ltd.
9816 Harding Street, P.O.Bag 4023
Fort McMurray, Alberta
T9H-3H5

F.A. Hemphill
Senior Business Advisor
(403)790-6464

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1.	Recovery of heavy minerals from froth treatment tailings.	2	Ti,Zr

Gulf Canada Corporation
401, 9th Avenue S.W. P.O. Box 130
Calgary, Alberta
T2P-2H7

A. Logan
Manager, Technology
(403)233-4324

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Coal beneficiation process.	16	coal

Coal Mining Research Company
P.O. Bag 1400
Devon, Alberta
T0E-1E0

P. White
President
(403)987-8181

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Washery optimization.	14	coal
2. Stabilization of dried coal.	16	coal
3. Advanced process for low ranked coal.	16	coal
4. Coal preparation and up-grading assistance.	16	coal
5. Moisture and ash on-stream analysis.	14	coal
6. Drier control - Phase I.	14	coal
7. Recovery of coal from tailings.	15	coal

Smoky River Coal Limited
P.O. box 2000
Grand Cache, Alberta
TOE-0Y0

D.A. Fawcett
Director, Surface Operations
(403)827-3711

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Agglomeration of coking coal.	16	coal

Afton Operating Corporation
P.O. Box 937
Kamloops, British Columbia
V2C-5N4

Peter Sievert
Senior Metallurgist
(604)374-5022

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Mill feasibility to process Ajax ore at Afton mill.	2	copper

B.C. Research
3650 Wesbrook Mall
Vancouver, British Columbia
V6S-2L2

R.O. McElroy
Group Leader, Metallurgy
(604)224-4331

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Coal dust agglomeration.	13	coal
2. Binders for coal agglomeration.	13	coal
3. Copper ore bioleaching.	10	copper
4. In situ Pb-Zn leaching.	10	zinc, lead
5. Wollastonite beneficiation.	6,7	ind. min.
6. Preparation of abrasive garnet.	7,8	ind. min.

BHP-Utah Mines Limited, Island Copper Oper.
P.O. Box 370
Port Hardy, British Columbia
VON-2PO

J.W.T. Bell
Chief Metallurgist
(604)949-6326

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Gyratory crusher liner.	3	Cu,Mo
2. Column flotation.	6	Cu, Mo
3. Flotation cell upgrading.	6	Cu,Mo
4. Gold recovery from tailings.	6,10	gold
5. Removal of hydrocarbon.	6,9,10	Mo
6. Leaching Cu from Mo concentrate.	10	Cu,Mo
7. Leaching Pb from Mo concentrate.	10	Cu,Mo
8. Cu dewatering process control.	11,12,14	copper

Consulting Engineer
12652-26A Avenue
White Rock, British Columbia
V4A-2M4

John W. Britton
Process Engineer
(604)531-2964

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Refractory gold recovery: Modified roasting techniques.	12	gold
2. Refractory gold recovery: Improved preleaching techniques.	10	gold,Cu
3. Chalcopyrite/sphalerite separation: Improved reagent development.	6	copper,zinc
4. Copper/molybdenum separation: Improved techniques.	6	copper, Mo

Cassiar Mining Corporation
P.O. Bag 1000
Cassiar, British Columbia
V0C-1E0

Melvin S. Taylor
Mill Superintendent
(604)778-7681

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Wet milling - enhanced recovery of asbestos through wet milling techniques.	2	asbestos
2. Fibre opening - opener fans for asbestos fibre.	4	asbestos
3. Weight control - pressure packer computerized weigh scale.	14	asbestos
4. Dust control - pug milling dry mill tailings.	15	asbestos

Cominco Limited/Cominco Research
P.O. Box 2000
Trail, British Columbia
V1R-4S4

M. J. Fairweather
Group leader, Mineral Treat.
(604)364-4447

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Column cell research, critical control variables.	6	zinc
2. Column cell research, applied mineralogy.	6	zinc,lead
3. Column cell research, fine sulphide separation.	6	zinc,lead
4. Recovery of marketable materials from waste products.	6,7,16	mica,zinc
5. Grinding, classification modelling.	4	zinc
6. Rare metals recovery research.	2,6,7,10	niobium
7. Column cell scale-up.	6	general

Cominco Limited, Sullivan Concentrator
P.O. Box 2000
Kimberley, British Columbia
V1A-2G3

B.S. Wakabayashi
Manager
(604)427-3577

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Column flotation.	6,14	lead,zinc
2. Grinding circuit study.	4,5,	lead,zinc
3. Fine grained lead/zinc ore.	6	lead,zinc
4. Mill expansion.	2,6	lead,zinc
5. Expert system.	6,14	lead,zinc
6. X-ray analysis.	14.16	lead,zinc
7. Computer system replacement.	14	lead,zinc

Fording Coal Ltd., Fording River Operation
P.O. Box 100
Elkford, British Columbia
V0B-1H0

J.D. Andrusiak
Superintendent processing
(604)865-2271

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Secondary fines dewatering sieve bends.	5	coal
2. Heavy media cyclone circuit expansion.	2	coal

Mascot Gold Mines Limited
P.O. Box 788
Penticton, British Columbia
V2A-6Y7

Richard Morrow
Junior Metallurgist
(604)292-8224

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Aeration-lime addition, pH vs protective alkalinity, air addition, oxygen addition.	10	gold
2. Leaching-pH and cyanide profiles, dissolved oxygen levels.	10	gold
3. Cyanide destruction, effects of hydrogen peroxide and sulphur dioxide on quality of barren solution and slurry.	15	gold

Teck Corporation, Beaverdell Division
P.O. Box 130
Beaverdell, British Columbia
V0H-1A0

Barry Given
Mill Superintendent
(604)484-5561

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Gravity separation-jig concentrate.	8	lead,silver
2. Flotation-gold, lead and zinc concentrates.	6	Ag,Pb,Zn

University of British Columbia
Department of Microbiology
Vancouver, British Columbia
V6T-1W5

Dr. Barry C. McBride
Professor, Head, Microbiology
(604)228-2501

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Adherance properties of thiobacillus to mineral surfaces.	10	general

University of British Columbia
Dept. Mining & Mineral Process Engineering
Vancouver, British Columbia
V6T-1W5

Andrew L. Mular
Professor and Head
(604)228-3983

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
1. Scale-up of SAG mills.	4	general
2. Modelling of SAG mills.	14	general
3. Recovery of fine gold from slag.	6,8	gold
4. Modeling of gravity separators.	8,14	general
5. Control of a 0.6 m-dia. sag mill circuit.	14	general
6. Column cell design for control.	14	general
Dr. J.S. Laskowski (604) 228-4949		
7. Rheology/stability of magnetite heavy medium suspensions.	8	general
8. Colloid chemistry of the weak electrolyte flotation systems.	6	general
9. The interactions between dextrin and metal hydroxide in aqueous solution.	6	general
10. The use of ion surfactant selective electrodes in flotation.	6	general
11. The role of mineral surface composition and hydrophobicity in polysaccharide/mineral interactions.	6	general
12. Humic acids in flotation processes.	6	coal

cont.

PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
13. Flotation of oxidized and/or low rank coals.	6	coal
14. Perlite filter aids.	general	coal

cont.

	PROJECT TITLE TITRE DU PROJET	CATEGORY CATÉGORIE	COMMODITY MATÉRIEL
15.	Evaluation of coal surface properties and coal floatability.	6	coal
16.	Desulphurising flotation of coal.	6	coal
	Dr. George W. Poling (604) 228-3981		
17.	Improved flotation of oxidized copper ores.	6	copper
18.	Improved flotation of cassiterite.	6	tin
19.	Recovery of fine particulate gold.	8	gold
20.	Improved separation of pyrrhotite and marmatite.	6,7	zinc
21.	Treatment of acid mine waters.	10,15	general
22.	Flocculation and flotation of apatite.	6,9	phosphate
23.	Flotation of micro-size diamonds.	6	diamonds
24.	Perlite filter aids.	11	general

SECTION TWO - Projects Listed by Categories

SECTION DEUX - Liste des Projects par Catégorie

MINERAL PROCESSING INDEX CATEGORIES

1. MILL ADMINISTRATION: includes manpower training and development, safety, management organization, data communication, mill maintenance systems, labour relations, consumables and parts inventory, accounting, daily performance reporting.

2. MILL FEASIBILITY: includes economic studies, evaluations, cost estimates and other projects undertaken to determine the potential success of major capital expenditures to develop a new mill, rehabilitate or expand an existing mill.

3. CRUSHING: includes wet and dry comminution by gyratory, jaw, cone, impact, roller, impact and compaction mills.

4. GRINDING: includes wet and dry steel, autogenous and semiautogenous, pebble mills, attrition mills, fine particle grinding such as pulverizers, jet mills, grinding aids, grinding media, liners, mill construction.

5. SIZING: includes wet and dry particle sizing using screens, cyclones, classifiers, hydrosizers, aspirators, trommels.

6. FLOTATION: includes investigations in flotation equipment, concentrate grade/recoveries, reagent development, bench, pilot and plant flowsheet testing and modification.

7. MAGNETIC SEPARATION: includes high and low intensity wet and dry separation.

8. GRAVITY & HEAVY MEDIA SEPARATION: includes use of reagents, media and equipment such as sluices, jigs, centrifuges, and heavy media separators such as drums and cones.

9. OTHER SEPARATION: includes sorting, electrostatic, electronic, and other miscellaneous separation techniques.

10. LEACHING/SOLUTION PURIFICATION/PRECIPITATION: by heap leaching or conventional techniques, solvent extraction/ion exchange, carbon absorption, precipitation, electrolysis, refining (precious metals).

11. LIQUID SOLID SEPARATION: includes thickening, filtration, clarification.

12. DRYING/CALCINING/PELLETIZING: includes use of binders, blenders, pelletizing discs, dust collection, fluid bed, flash and rotory dryers, and other types of drying and heat-treatment processes and equipment.

13. MATERIAL HANDLING: includes the movement of wet and dry material through bins, pipes, conveyors, elevators, feeders, chutes, bagging machines, pelletizing, concentrate handling and storage.

14. PROCESS CONTROL: includes development of primary sensors, automatic control systems, computer control, expert systems, modeling.

15. TAILINGS AND WASTE MANAGEMENT: includes backfill preparation, tailings treatment and control, water recycle, construction, slurry transportation, etc.

16. OTHER: This category is reserved for R&D work not adequately covered by the previous categories.

CATÉGORIES DU RÉPERTOIRE DE PROJETS SUR LE TRAITEMENT DES MINÉRAUX

1. ADMINISTRATION DE L'USINE: comprend la formation et le perfectionnement de la main-d'oeuvre, la sécurité, l'organisation de la gestion, la communication des données, les systèmes d'entretien de l'usine, les relations de travail, l'inventaire des produits consommables et des pièces, la comptabilité, le rapport de rendement quotidien.

2. FAISABILITÉ DE L'USINE: comprend des analyses économiques, des évaluations, des estimations de coûts et d'autres études ayant pour objet de déterminer comment d'importantes dépenses en capital peuvent permettre concrètement d'établir une nouvelle usine, de remettre en état une usine existante ou de l'argrandir.

3. CONCASSAGE: comprend la fragmentation par voie humide et par voie sèche, au moyen d'un concasseur giratoire, d'un concasseur à mâchoire, d'un broyeur conique, d'un broyeur à percussion, d'un moulin à cylindres, d'un broyeur-compacteur.

4. BROYAGE: comprend le broyage à tige et à boulet par voie humide et par voie sèche, l'autobroyage et le broyage semi-autogène, les broyeurs à galets, les broyeurs par attrition, les broyeurs de particules fines tels que le pulvérisateurs, les broyeurs à tuyère, les agents de mouture, les corps broyants, les bandes de garnissages, la construction de broyeurs.

5. CLASSEMENT: comprend le classement des particules par voie sèche et par voie humide au moyen de cribles, de cyclones, de classificateurs, d'hydroclasseurs, d'aspirateurs, de trommels.

6. FLOTTATION: comprend des études du matériel de flottation, la teneur/récupération de concentrés, l'élaboration de réactifs, les essais et la modification de schémas de traitement dans le laboratoire, à l'échelle pilote et dans l'usine.

7. SÉPARATION MAGNÉTIQUE: comprend la séparation en milieu humide et à sec à haute et à basse intensité.

8. SÉPARATION PAR GRAVITÉ ET EN MILIEU DENSE: comprend l'utilisation de milieu denses et d'installations telles que des sluices, des bacs à pistonnage, des centrifugeuses et des séparateurs en milieu dense comme des tambours et des cônes.

9. AUTRES TECHNIQUES DE SÉPARATION: comprend le triage, la séparation électrostatique, la séparation électronique et d'autres techniques de séparation.

10. LIXIVIATION/PURIFICATION DES SOLUTIONS/PRÉCIPITATION: par lixiviation en tas ou au moyen de techniques classiques, extraction par solvant/échange d'ions, absorption du carbone, précipitation, electrolyse, raffinage (métaux précieux).

11. SÉPARATION LIQUIDE-SOLIDE: comprend l'épaississement, la filtration, la clarification.

12. SÉCHAGE/CALCINATION/BOULETAGE: comprend l'utilisation de liants, de malaxeurs, de disques de bouletage, de capteurs de poussières, de sécheurs en lit fluidisé-flash-rotatifs et d'autres procédés et matériel de séchage et de traitement thermique.

13. MANUTENTION DES MATÉRIAUX: comprend le transport des matériaux secs et humides qui passent dans des réservoirs, des canalisations, des convoyeurs, des ascenseurs, des alimentateurs, des couloirs et des machines d'enséchage le bouletage et la manutention et l'entreposage de concentrés.

14. CONTROLE DES PROCÉDÉS: comprend la mise au point de capteurs primaires, les systèmes de commande automatique, la commande par ordinateur, les systèmes-experts, la modélisation.

15. GESTION DES RÉSIDUS ET DES DÉCHETS: comprend la préparation de remblais, le traitement et le contrôle des résidus, le recyclage de l'eau, la construction, le transport des bouillies, etc.

16. AUTRES: cette catégorie est réservée au travail de R-D qui ne figure pas dans les catégories précédentes.

1. MILL ADMINISTRATION / ADMINISTRATION de L'USINE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Application of statistical process control (SPA) in coal preparation.	coal	4.3
2. Computerized planned maintenance.	general	4.4
3. Mineralogical study and heap leaching of New Brunswick precious metal ores.	gold/silver	5.3
4. Manpower training, work safety, milling specialities.	general	66.4
5. Mill commissioning systems.	general	77.1
6. Training of operators.	general	79.1

2. MILL FEASIBILITY / FAISABILITÉ de L'USINE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Computer process simulation of mineral processing facilities using ASPEN software.	general	3.2
2. Feasibility study of Eastern Canadian coal conversion via IGCC technology.	coal	3.3
3. Further processing of antimony concentrates.	antimony	5.2
4. Characterization and recovery of the less common metals from New Brunswick ores and tailings	general	5.4
5. Benefication of complex sulphide ores to make bulk concentrates for ferric chloride leaching	Zn,Pb,Cu	5.5
6. Investigation of process options for Mount Pleasant Tungsten ores.	W,Sn,Mo	5.6
7. Development of vat leaching technology for application in the New Brunswick climate.	gold	8.1
8. Expansion and process development of a custom gold mill using gravity and flotation.	gold	9.1
9. Assessment of the alkali reactivity of potential concrete aggregates of Newfoundland.	concrete	10.1
10. Assessment of binders for pelletizing iron ore.	iron ore	10.2
11. Diagnostic d'opération de quatre usines de traitement des minerais d'or de l'Abitibi-Témiscamingue.	or	34.5
12. Evaluation of the Point Leamington Deposit Phase II.	iron ore	45.4
13. Construction of new mill to handle mine ore and reclaimed tailings.	gold	48.1
14. Separate copper ore processing.	copper	53.6
15. Metallurgical performance of the Winston Lake mill.	zinc, Cu	65.1

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
16. C.I.P. scavenging circuit.	gold	68.1
17. Namew Lake mill, new Cu,Ni mine and mill.	nickel, Cu	72.1
18. Flin Flon mill modernization, flotation circuit.	Zn,Cu,Au	72.4
19. Trout Lake ore metallurgy.	Zn,Cu, Au	72.5
20. Feasibility study, gold processing mill, Snow Lake area.	gold	73.6
21. Mineral processing and economic evaluation of the Bird River chromite deposit.	chromium	73.9
22. New SX plant.	uranium	76.1
23. Mill commissioning systems.	general	77.1
24. Process development - potassium sulphate.	potash	78.6
25. Process development, potassium phosphate.	potash	78.7
26. Recovery of heavy minerals from froth treatment tailings.	Ti,Zr	83.1
27. Mill feasibility to process Ajax ore at Afton mill.	copper	87.1
28. Wet milling - enhanced recovery of asbestos through wet milling techniques.	asbestos	91.1
29. Rare metals recovery research.	niobium	92.6
30. Mill expansion.	lead,zinc	93.4
31. Heavy media cyclone circuit expansion.	coal	94.2

3. CRUSHING / CONCASSAGE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bench scale beneficiation tests of New Brunswick oil shale.	oil	3.4
2. Optimizing rotary breaker performance.	coal	4.7
3. Process development for industrial minerals.	ind. min.	5.7
4. Gravity separation of Pine Brook barite for recovery of mud-grade product.	barite	12.1
5. Echantillonnage systématique pour le minerai concassé à la discharge du concasseur secondaire.	or	17.1
6. Crusher dust collection improvements.	copper,zinc	23.1
7. Sandstone reduction by attritor grinding.	silica	31.17
8. Improved mill wear materials.	general	45.9
9. Crushing.	silver	49.1
10. Crushing plant modernization/automation.	nickel,Cu	53.4
11. Automating crusher house feed rate controls.	general	55.2
12. Crusher automation.	Zn,Cu,Au	72.3
13. Improve the crushing circuit.	gold	79.2
14. Gyratory crusher liner.	Cu,Mo	89.1

4. GRINDING / BROYAGE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bench scale beneficiation tests of New Brunswick oil shale.	oil	3.4
2. Production of high solids content coal slurry (coal water fuel,CWF) for direct firing/combustion.	coal	4.1
3. Optimization of grade and recovery at Durham Antimony mine by improving grinding circuit operation.	antimony	5.1
4. Benefication of complex sulphide ores to make bulk concentrates for ferric chloride leaching	Zn,Pb,Cu	5.5
5. Investigation of process options for Mount Pleasant Tungsten ores.	W,Sn,Mo	5.6
6. Process development for industrial minerals.	ind. min.	5.7
7. Criblage des mixtes recirculés au broyeur pour éviter le surbroyage de la partie fine des mixtes.	min de fer	14.2
8. Re-design of grinding circuit.	gold	20.1
9. Grinding circuit mass balance.	gold	22.1
10. Ball size optimization.	gold	22.2
11. Circuit de broyage en série.	or	24.3
12. Grinding circuit control.	gold	25.1
13. Grinding media evaluation.	gold	25.2
14. Identification of technology for use by the industrial mineral industry to reduce energy consumption.	ind. min.	29.1
15. Correlation of mineral liberation to ore characteristics and grinding methods.	general	30.14
16. Sandstone reduction by attritor grinding.	silica	31.17

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
17. Evaluation de diverses méthodes de mesure de l'indice de broyabilité d'un minerai.	general	33.2
18. Contrôle du broyage.	général	40.5
19. Grinding circuit investigations.	general	45.8
20. Improved mill wear materials.	general	45.9
21. Grinding.	silver	49.2
22. Grinding circuit automation.	nickel,Cu	53.3
23. Attrition milling of calcine residues.	gold	69.1
24. Flash flotation cell.	gold	72.2
25. Rubber lining auto mill.	uranium	76.2
26. Optimization of grinding circuit.	gold	79.3
27. Integrated agglomeration test facility (IATF).	coal	81.1
28. Development of AGFLOTHERM process for coal, beneficiation and coal heavy oil co-processing.	coal,oil	81.2
29. Fibre opening - opener fans for asbestos fibre.	asbestos	91.2
30. Grinding, classification modelling.	zinc	92.5
31. Grinding circuit study.	lead,zinc	93.2
32. Scale-up of SAG mills.	general	98.1

5. SIZING / CALIBRAGE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bench scale beneficiation tests of New Brunswick oil shale.	oil	3.4
2. Production of high solids content coal slurry (coal water fuel,CWF) for direct firing/combustion.	coal	4.1
3. Gravity separation of Pine Brook barite for recovery of mud-grade product.	barite	12.1
4. Criblage des mixtes recirculés au broyeur pour éviter le surbroyage de la partie fine des mixtes.	min de fer	14.2
5. Identification of technology for use by the industrial mineral industry to reduce energy consumption.	ind. min.	29.1
6. Fine hydrocycloning.	general	41.1
7. Coarse hydrocycloning.	general	41.2
8. Grinding circuit investigations.	general	45.8
9. Sizing.	silver	49.3
10. Grinding circuit automation.	nickel,Cu	53.3
11. Pyrrhotite/pentlandite (Po/Pn) separation.	nickel	53.9
12. Compaction of potash fines.	potash	78.9
13. Modelling the cyclones.	gold	79.4
14. Integrated agglomeration test facility (IATF).	coal	81.1
15. Development of AGFLOTHERM process for coal, beneficiation and coal heavy oil co-processing.	coal,oil	81.2
16. Grinding circuit study.	lead,zinc	93.2
17. Secondary fines devatering sieve bends.	coal	94.1

6. FLOTATION / FLOTTATION

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bench scale beneficiation tests of New Brunswick oil shale.	oil	3.4
2. Production of high solids content coal slurry (coal water fuel,CWF) for direct firing/combustion.	coal	4.1
3. Optimization of grade and recovery at Durham Antimony mine by improving grinding circuit operation.	antimony	5.1
4. Benefication of complex sulphide ores to make bulk concentrates for ferric chloride leaching	Zn,Pb,Cu	5.5
5. Investigation of process options for Mount Pleasant Tungsten ores.	W,Sn,Mo	5.6
6. Process development for industrial minerals.	ind. min.	5.7
7. Potash coarse rougher flotation.	potash	6.1
8. Coarse flotation of antimony sulphide from the recirculating stream of the secondary grinding circuit.	antimony	7.2
9. Studies to improve iron ore recovery at the Scully Mine.	iron ore	10.3
10. Preparation and evaluation of selected Nova Scotia industrial minerals as fillers and extenders.	ind. min.	11.1
11. Talc/chlorite depression in sulfide flotation.	copper,zinc	15.1
12. Alternatives for a selective copper sulfide collector.	copper	15.2
13. Use of Eh to improve selectivity and predict ore type changes.	copper	15.3
14. Optimisation de la récupération de l'or par gravité, par flottation et par la cyanuration des rejets.	or	19.1

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
15. Flottation d'un minérais réfractaire de Cu/Zn contenant principalement de la pyrite (près de 90%) (Projet Mobrun).	cuivre,zinc	21.1
16. Flottation d'un minérais de sulfure massif de Cu contenant principalement de la pyrhotine (Projet Ansil).	cuivre	21.2
17. Pyrite flotation and cyanidation.	gold	22.4
18. Flotation cell rebuild.	copper,zinc	23.2
19. Flash flottation.	or	24.2
20. The identification , quantifying, testing and application of biological phenomena in the mineral and fossil fuels industries.	general	27.8
21. Beneficiation of complex and refractory ores.	Cu,Pb,Zn	30.11
22. Correlation of mineral liberation to ore characteristics and grinding methods.	general	30.14
23. Optimization of column flotation.	general	31.19
24. Flottation du pyrochlore à l'aide de réactifs chélatants.	niobium	33.1
25. Dimensionnement des circuits industriels de flottation.	general	35.11
26. MacRae celestite Loch Lomond, Cape Breton. Concentrate and conversion to strontium carbonate.	celestite	36.1
27. The development of an expert system to control the Polaris Mine flotation circuit.	lead/zinc	37.1
28. Column flotation application for coarse lead.	lead/zinc	37.2
29. Column flotation applied to zinc cleaning.	zinc	37.3
30. Contrôle de la flottation.	général	40.6
31. Column flotation, testing/scale up in.	general	42.1

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
32. Column flotation, basic studies in.	general	42.2
33. Column flotation, control measurements in.	general	42.3
34. Electrochemistry of sulphide flotation, basic study in.	general	42.6
35. Fe/Zn separation using N_2 flotation of pyrite.	zinc	42.7
36. Zn activation with metal hydroxides.	zinc	42.8
37. Electrodes for pulp potential.	general	42.9
38. Recycle water treatment, microbiological and physical adsorption in.	general	42.10
39. Improving metal recoveries of partly oxidized sulphide ores using organic reagents.	zinc/lead	43.1
40. Récupération du pyrochlore noir et de la colombite.	niobium	44.1
41. Flottation des carbonates par d'autres collecteurs que les acides gras.	niobium	44.2
42. Amélioration de la qualité de l'eau recyclée.	niobium	44.3
43. Flottation du pyrochlore déschlammé à 3-5 um.	niobium	44.4
44. Mineral process development.	general	45.3
45. Development of a small scale continuous flotation cell.	general	45.7
46. Flotation.	silver	49.4
47. Amine flotation of low grade North Americian chromite ores.	chromite	50.3
48. Mineral flotation with organic liquids and correlation of effect with molecular structure.	general	50.6
49. Column flotation.	nickel,Cu	53.1
50. Pyrrhotite/pentlandite (Po/Pn) separation.	nickel	53.9

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
51. Flotation blower rationalization.	general	53.11
52. Flotation, pyrrhotite reduction.	nickel	59.1
53. Gold recovery, flotation.	gold	59.4
54. Grinding, mill rationalization.	nickel, Cu	59.5
55. Aerosol reagent addition in column flotation.	general	60.1
56. Column flotation, column simulator.	general	60.2
57. Column flotation, froth performance analysis.	general	60.3
58. Column flotation, interface sensing.	general	60.4
59. Particle collection physics.	general	60.5
60. Characterizing and cleaning of zinc concentrates.	zinc	60.6
61. Flotation test replacement project.	Zn,Pb,Cu	66.3
62. Sulphur dioxide reduction, pyrrhotite rejection.	nickel	70.1
63. Column flotation.	Zn,Cu	71.1
64. Flash flotation cell.	gold	72.2
65. Flin Flon mill modernization, flotation circuit.	Zn,Cu,Au	72.4
66. Trout Lake ore metallurgy.	Zn,Cu, Au	72.5
67. Upgrading of feldspar.	feldspar	73.10
68. Column flotation.	potash	78.5
69. R&D: concentration of gold in tailings by flotation.	gold	79.5
70. Flotation of fine coal.	coal	80.1
71. Integrated agglomeration test facility (IATF).	coal	81.1

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
72. Development of AGFLOTHERM process for coal, beneficiation and coal heavy oil co-processing.	coal,oil	81.2
73. Wollastonite beneficiation.	ind. min.	88.5
74. Column flotation.	Cu, Mo	89.2
75. Flotation cell upgrading.	Cu,Mo	89.3
76. Gold recovery from tailings.	gold	89.4
77. Removal of hydrocarbon.	Mo	89.5
78. Chalcopyrite/sphalerite separation: Improved reagent development.	copper,zinc	90.3
79. Copper/molybdenum separation: Improved techniques.	copper, Mo	90.4
80. Column cell research, critical control variables.	zinc	92.1
81. Column cell research, applied mineralogy.	zinc,lead	92.2
82. Column cell research, fine sulphide separation.	zinc,lead	92.3
83. Recovery of marketable materials from waste products.	mica,zinc	92.4
84. Rare metals recovery research.	niobium	92.6
85. Column cell scale-up.	general	92.7
86. Column flotation.	lead,zinc	93.1
87. Fine grained lead/zinc ore.	lead,zinc	93.3
88. Mill expansion.	lead,zinc	93.4
89. Expert system.	lead,zinc	93.5
90. Flotation-gold, lead and zinc concentrates.	Ag,Pb,Zn	96.2
91. Recovery of fine gold from slag.	gold	98.3

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
92. Colloid chemistry of the weak electrolyte flotation systems.	general	98.8
93. The interactions between dextrin and metal hydroxide in aqueous solution.	general	98.9
94. The use of ion surfactant selective electrodes in flotation.	general	98.10
95. The role of mineral surface composition and hydrophobicity in polysaccharide/mineral interactions.	general	98.11
96. Humic acids in flotation processes.	coal	98.12
97. Flotation of oxidized and/or low rank coals.	coal	99.13
98. Evaluation of coal surface properties and coal floatability.	coal	100.15
99. Desulphurising flotation of coal.	coal	100.16
100. Improved flotation of oxidized copper ores.	copper	100.17
101. Improved flotation of cassiterite.	tin	100.18
102. Improved separation of pyrrhotite and marmatite.	zinc	100.20
103. Flocculation and flotation of apatite.	phosphate	100.22
104. Flotation of micro-size diamonds.	diamonds	100.23

7. MAGNETIC SEPARATION / SÉPARATION MAGNETIQUE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bench scale beneficiation tests of New Brunswick oil shale.	oil	3.4
2. Characterization and recovery of the less common metals from New Brunswick ores and tailings	general	5.4
3. Investigation of process options for Mount Pleasant Tungsten ores.	W,Sn,Mo	5.6
4. Process development for industrial minerals.	ind. min.	5.7
5. Preparation and evaluation of selected Nova Scotia industrial minerals as fillers and extenders.	ind. min.	11.1
6. Magnetic hydrocyclones, dense media recovery in.	general	42.4
7. Pyrrhotite/pentlandite (Po/Pn) separation.	nickel	53.9
8. Mixing conditions in high gradient magnetic separators.	general	60.7
9. Dry magnetic separation of clay from potash ore.	potash	74.2
10. Modification of magnetic properties of NaCl and KCl.	potash	74.3
11. Magnetic separation.	potash	78.3
12. Wollastonite beneficiation.	ind. min.	88.5
13. Preparation of abrasive garnet.	ind. min.	88.6
14. Recovery of marketable materials from waste products.	mica,zinc	92.4
15. Rare metals recovery research.	niobium	92.6
16. Improved separation of pyrrhotite and marmatite.	zinc	100.20

8. GRAVITY,HEAVY MEDIA SEPARATION/SÉPARATION PAR GRAVITÉ, MILIEU DENSE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bench scale beneficiation tests of New Brunswick oil shale.	oil	3.4
2. Heavy media cyclone operation at S.G lower than 1.3.	coal	4.5
3. Characterization and recovery of the less common metals from New Brunswick ores and tailings	general	5.4
4. Investigation of process options for Mount Pleasant Tungsten ores.	W,Sn,Mo	5.6
5. Process development for industrial minerals.	ind. min.	5.7
6. Studies to improve iron ore recovery at the Scully Mine.	iron ore	10.3
7. Preparation and evaluation of selected Nova Scotia industrial minerals as fillers and extenders.	ind. min.	11.1
8. Gravity separation of Pine Brook barite for recovery of mud-grade product.	barite	12.1
9. Regrind of spiral middlings.	iron ore	13.1
10. Efficacité des spirales pour la récupération du fer en divisant l'alimentation régulière en deux parties: fine et grossière.	min de fer	14.1
11. Optimisation de la récupération de l'or par gravité, par flottation et par la cyanuration des rejets.	or	19.1
12. Gravity separation.	gold	22.3
13. The development of new or improved processes to increase recovery and reduce costs in treating gold ores.	gold	28.10
14. Optimization of unit operations used in placer mining.	gold	29.3

8. GRAVITY,HEAVY MEDIA SEPARATION/SÉPARATION PAR GRAVITÉ, MILIEU DENSE cont.

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
15. Recovery of fine placer gold from sluice box tailings.	gold	31.20
16. Image analysis study of products from various parts of the Quebec Cartier Mining Company spiral circuit.	iron ore	31.21
17. Magnetic hydrocyclones, dense media recovery in.	general	42.4
18. Mineral process development.	general	45.3
19. Gravity and heavy media separation.	silver	49.5
20. Gold recovery, jigging.	gold	59.3
21. Heavy media separation pilot plant test on GECO ore.	Zn,Pb,Cu	66.2
22. Study of the effect of particle shape on gravity table concentration.	ind. min.	73.2
23. Upgrading of feldspar.	feldspar	73.10
24. HMS of potash using tri flow separator.	potash	74.1
25. Dense media separation of potash ore using tri flo dense media separation phase 1 study.	potash	75.1
26. Dense media separation of potash ore using tri flo dense media separation phase II study.	potash	75.2
27. Preparation of abrasive garnet.	ind. min.	88.6
28. Gravity separation-jig concentrate.	lead,silver	96.1
29. Recovery of fine gold from slag.	gold	98.3
30. Modeling of gravity separators.	general	98.4
31. Rheology/stability of magnetite heavy medium suspensions.	general	98.7
32. Recovery of fine particulate gold.	gold	100.19

9. OTHER SEPARATION / AUTRES TECHNIQUES de SÉPARATION

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Further processing of antimony concentrates.	antimony	5.2
2. Characterization and recovery of the less common metals from New Brunswick ores and tailings	general	5.4
3. Benefication of complex sulphide ores to make bulk concentrates for ferric chloride leaching	Zn,Pb,Cu	5.5
4. Investigation of process options for Mount Pleasant Tungsten ores.	W,Sn,Mo	5.6
5. Process development for industrial minerals.	ind. min.	5.7
6. Studies related to asbestos - wet milling, characterization of fibres and bore hole analysis.	asbestos	29.4
7. Improved recovery technology for the treatment of fine particles.	general	31.16
8. Coal/oil agglomeration of precious metals and/or sulphides.	general	56.3
9. Membrane processing of oil-field produced water for enhanced oil recovery for steam generation.	oil	64.1
10. Electrostatic separation.	potash	78.8
11. Study of Mineral Deposit's new LD4 spiral for separation of fine coal.	coal	80.2
12. Integrated agglomeration test facility (IATF).	coal	81.1
13. Development of AGFLOTHERM process for coal, beneficiation and coal heavy oil co-processing.	coal,oil	81.2
14. Removal of hydrocarbon.	Mo	89.5
15. Flocculation and flotation of apatite.	phospnate	100.22

10. LEACHING / LIXIVIATION

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bacterial leaching re:precious metal recovery and coal desulphurization.	gold/coal	3.1
2. Further processing of antimony concentrates.	antimony	5.2
3. Mineralogical study and heap leaching of New Brunswick precious metal ores.	gold/silver	5.3
4. Characterization and recovery of the less common metals from New Brunswick ores and tailings	general	5.4
5. Benefication of complex sulphide ores to make bulk concentrates for ferric chloride leaching	Zn,Pb,Cu	5.5
6. Investigation of process options for Mount Pleasant Tungsten ores.	W,Sn,Mo	5.6
7. Development of vat leaching technology for application in the New Brunswick climate.	gold	8.1
8. Copper recovery and cyanide regeneration for use at Hope Brook gold property.	gold, copper	10.4
9. Preparation and evaluation of selected Nova Scotia industrial minerals as fillers and extenders.	ind. min.	11.1
10. Traveaux pour déterminer les critères d'utilisation de la thiourée.	or	16.1
11. Optimisation de la récupération de l'or par gravité, par flottation et par la cyanuration des rejets.	or	19.1
12. Fine particle cyanidation.	gold	22.5
13. Cyanuration du matériel de remblai.	or	24.1
14. The development and evaluation of a chloride metallurgical process for the treatment of bulk sulphide concentrates.	Cu,Pb,Zn,Ag	27.1
15. The development of improved technologies for the characterization, disposition and control of impurities in electrolytic copper refining.	copper	27.2

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
16. The identification , quantifying, testing and application of biological phenomena in the mineral and fossil fuels industries.	general	27.8
17. The optimization of a pressure leaching process to solubilise radium when leaching uranium ores.	uranium	28.9
18. The development of new or improved processes to increase recovery and reduce costs in treating gold ores.	gold	28.10
19. The development of a process for recovering platium group metals from a Canadian ore.	platium	28.11
20. The development of technology for the recovery and purification of lanthanides and associated metals from a Canadian ore.	rare earths	28.12
21. To elucidate the behaviour of silver in conventional zinc plants nd the development of new technology to improve silver recovery.	silver, zinc	28.13
22. A study of the potential for heap leaching of placer deposits in the Yukon.	gold	29.2
23. Lixiviation en tas des tailings de Montauban.	or	38.1
24. Simulation du procédé CEP.	or	40.2
25. Simulation et contrôle de la cyanuration.	or	40.3
26. Large scale heap leaching of lov grade gold ore.	gold	47.1
27. Extraction of FeCr from Bird River, Manitoba chromite deposits.	chromite	50.2
28. Hydrometallurgical production of pigment grade zinc oxide.	zinc	50.4
29. Leaching of low-grade minerals with subseqent electrolytic precipitation.	zinc	50.5
30. Large scale underground testing of bacterially assisted leaching methods.	uranium	52.1

10. LEACHING / LIXIVIATION cont.

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
31. Bacterial leaching of uranium ores.	uranium	54.1
32. Product purity, thorium elimination.	uranium	54.5
33. Copper ion removal from gold process solutions.	gold, copper	56.1
34. Cyanide regeneration from gold process solutions.	gold	56.2
35. Biological leaching of uranium ore.	uranium	61.1
36. Application of partial desulfurization roasting to the extractive metallurgy of zinc.	zinc	62.1
37. Bio-oxidation of refractory ores.	general	63.1
38. Processes for obtaining environmentally safe uranium mill tailings.	uranium	67.1
39. C.I.P. scavenging circuit.	gold	68.1
40. Airless reverse flow (A.R.F.) carbon retention screens.	gold	69.2
41. Bacterial leaching of Flin Flon ore.	Zn,Cu,Au	72.6
42. GCM iron chloride process for leaching of copper sulphides.	copper	73.3
43. Recovery of gold and silver from zinc pressure leach residue.	gold,silver	73.4
44. Recovery of base and precious metals from oxide residue from zinc fuming plant.	Zn,Pb,Cu,Au	73.5
45. Crystallization.	potash	78.11
46. Low temperature crystallization.	potash	78.12
47. Reduce reagent consumption.	gold	79.6
48. Copper ore bioleaching.	copper	88.3
49. In situ Pb-Zn leaching.	zinc, lead	88.4

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
50. Gold recovery from tailings.	gold	89.4
51. Removal of hydrocarbon.	Mo	89.5
52. Leaching Cu from Mo concentrate.	Cu,Mo	89.6
53. Leaching Pb from Mo concentrate.	Cu,Mo	89.7
54. Refractory gold recovery: Improved preleaching techniques.	gold,Cu	90.2
55. Rare metals recovery research.	niobium	92.6
56. Aeration-lime addition, pH vs protective alkalinity, air addition, oxygen addition.	gold	95.1
57. Leaching-pH and cyanide profiles, dissolved oxygen levels.	gold	95.2
58. Adherance properties of thiobacillus to mineral surfaces.	general	97.1
59. Treatment of acid mine waters.	general	100.21

11. LIQUID SOLID SEPARATION / SÉPARATION LIQUIDE-SOLIDE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Production of high solids content coal slurry (coal water fuel,CWF) for direct firing/combustion.	coal	4.1
2. Pyrite flotation and cyanidation.	gold	22.4
3. Optimization of unit operations used in placer mining.	gold	29.3
4. Sedimentation characteristics of Cu/Ni mill tailings and thickener size estimation.	general	51.8
5. Slurry densification and transportation.	nickel, Cu	53.2
6. Liquid/solid separation, nickel concentrate filtration.	nickel	59.2
7. Application of partial desulfurization roasting to the extractive metallurgy of zinc.	zinc	62.1
8. Concentrate dewatering, control and automation	Zn,Pb,Cu	66.1
9. Slimes separation.	potash	78.2
10. Electro-coagulation.	potash	78.4
11. Testing of electro-coagulation on our thickener water.	coal	80.3
12. Cu dewatering process control.	copper	89.8
13. Perlite filter aids.	general	100.24

12. DRYING / SÉCHAGE

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Infrared drying of antimony sulphide.	antimony	7.1
2. Assessment of binders for pelletizing iron ore.	iron ore	10.2
3. Development of a method for controlling moisture content of concentrates produced at Quebec Cartier Mining Company.	iron ore	30.10
4. Développement d'une méthode de mesure du collage du minerai de fer lors de la réduction directe.	min de fer	33.9
5. Développement d'un essai de simulation de la technique d'agglomeration (sintering) du minerai de fer.	min de fer	33.10
6. Simulation et contrôle de la cuisson des boulettes de concentré defer.	min de fer	40.4
7. Compaction of potash fines.	potash	78.9
8. Integrated agglomeration test facility (IATF).	coal	81.1
9. Cu dewatering process control.	copper	89.8
10. Refractory gold recovery: Modified roasting techniques.	gold	90.1

13. MATERIAL HANDLING / MANUTENTION des MATÉRIAUX

	PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1.	Production of high solids content coal slurry (coal water fuel,CWF) for direct firing/combustion.	coal	4.1
2.	Optimization of compaction of fine potash products.	potash	6.2
3.	Gondola car-cover handling crane.	copper,zinc	23.4
4.	Optimization of unit operations used in placer mining.	gold	29.3
5.	Improved mill wear materials.	general	45.9
6.	Slurry densification and transportation.	nickel, Cu	53.2
7.	Crushing plant modernization/automation.	nickel,Cu	53.4
8.	Fine ore feeder automation.	general	53.8
9.	Testing ceramic tiled, conveyor skirting applications.	general	55.1
10.	Integrated agglomeration test facility (IATF).	coal	81.1
11.	Development of AGFLOTHERM process for coal, beneficiation and coal heavy oil co-processing.	coal,oil	81.2
12.	Coal dust agglomeration.	coal	88.1
13.	Binders for coal agglomeration.	coal	88.2

14. PROCESS CONTROL / CONTROLE des PROCÉDÉS

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Computer process simulation of mineral processing facilities using ASPEN software.	general	3.2
2. Feasibility study of Eastern Canadian coal conversion via IGCC technology.	coal	3.3
3. Production of high solids content coal slurry (coal water fuel,CWF) for direct firing/combustion.	coal	4.1
4. Application of statistical process control (SPA) in coal preparation.	coal	4.3
5. Spiral feed density control.	iron ore	13.2
6. Tailings line velocity control.	iron ore	13.3
7. Contrôle en continu des valeurs aurifères.	or	16.2
8. Echantillonneur systématique pour le minerai concassé à la discharge du concasseur secondaire.	or	17.1
9. Process control.	gold	22.6
10. Process computer installations.	copper,zinc	23.3
11. Grinding circuit control.	gold	25.1
12. The development of new and improved methods for analysing mineral processing and metallurgical products.	general	26.1
13. The preparation of certified samples of ores, concentrates, metals and related materials.	general	26.2
14. The development of improved technologies for the characterization, disposition and control of impurities in electrolytic copper refining.	copper	27.2
15. The characterization of the properties of metal-As-O systems and the development of a solid state sulphur probe.	arsenic,S	27.7

14. PROCESS CONTROL / CONTROLE des PROCÉDÉS cont.

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
16. The identification , quantifying, testing and application of biological phenomena in the mineral and fossil fuels industries.	general	27.8
17. Identification of technology for use by the industrial mineral industry to reduce energy consumption.	ind. min.	29.1
18. Process control and development of expert systems for an oil sands extraction plant.	oil sands	30.12
19. Development of expert systems for use in a flo tation plant computer control scheme.	general	30.13
20. Augmenter la qualité de la fibre d'amiante en utilisant un contrôle automatique.	amiante	34.11
21. Dimensionnement des circuits industriels de flottation.	general	35.11
22. The development of an expert system to control the Polaris Mine flotation circuit.	lead/zinc	37.1
23. Bilans minéralurgiques.	général	40.1
24. Simulation du procédé CEP.	or	40.2
25. Simulation et contrôle de la cyanuration.	or	40.3
26. Simulation et contrôle de la cuisson des boulettes de concentré defer.	min de fer	40.4
27. Contrôle du broyage.	général	40.5
28. Contrôle de la flottation.	général	40.6
29. Systèmes experts.	général	40.7
30. Modélisation des procédés dynamiques.	général	40.8
31. Column flotation, control measurements in.	general	42.3
32. Instrumentation for milling operations.	general	45.1
33. Mill control implementation.	general	45.5

14. PROCESS CONTROL / CONTROLE des PROCÉDÉS cont.

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
34. Advanced process control and modelling.	general	45.6
35. Column flotation.	nickel,Cu	53.1
36. Grinding circuit automation.	nickel,Cu	53.3
37. Crushing plant modernization/automation.	nickel,Cu	53.4
38. Distributed process control system.	nickel,Cu	53.5
39. Fine ore feeder automation.	general	53.8
40. Retrofit of computer control system.	nickel,Cu	53.10
41. Flotation blower rationalization.	general	53.11
42. Leach acid control.	uranium	54.2
43. On-stream uranium analysis.	uranium	54.3
44. Automating crusher house feed rate controls.	general	55.2
45. Installation of a distributed control instrumentation package.	general	55.3
46. Control of fixed bed ion exchange by on-stream analysis of barren streams.	general	55.4
47. Particle size analyser.	general	58.1
48. Pulp density monitor.	general	58.2
49. Particle collection physics.	general	60.5
50. Biological leaching of uranium ore.	uranium	61.1
51. Flotation process control.	Zn,Cu	71.2
52. Computerized process control.	potash	74.4
53. Computer model for water balance.	uranium	76.3
54. Mill commissioning systems.	general	77.1
55. K40 instrumentation.	potash	78.1

14. PROCESS CONTROL / CONTROLE des PROCÉDÉS cont.

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
56. Crystallization.	potash	78.11
57. Automatic particle size analyser.	potash	78.13
58. Process control of all circuits in the mill.	gold	79.7
59. Integrated agglomeration test facility (IATF).	coal	81.1
60. Development of AGFLOTHERM process for coal, beneficiation and coal heavy oil co-processing.	coal,oil	81.2
61. Washery optimization.	coal	85.1
62. Moisture and ash on-stream analysis.	coal	85.5
63. Drier control - Phase I.	coal	85.6
64. Cu dewatering process control.	copper	89.8
65. Weight control - pressure packer computerized weigh scale.	asbestos	91.3
66. Column flotation.	lead,zinc	93.1
67. Expert system.	lead,zinc	93.5
68. X-ray analysis.	lead,zinc	93.6
69. Computer system replacement.	lead,zinc	93.7
70. Modelling of SAG mills.	general	98.2
71. Modeling of gravity separators.	general	98.4
72. Control of a 0.6 m-dia. sag mill circuit.	general	98.5
73. Column cell design for control.	general	98.6

15. TAILINGS / RÉSIDUS

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bacterial leaching re:precious metal recovery and coal desulphurization.	gold/coal	3.1
2. Potash tailings backfill and consolidation.	potash	6.3
3. Tailing management-cyanide destruction.	gold	22.7
4. The determination of the characteristics of acid producing sulphide tailings and assessment of current management techniques.	sulphur	27.4
5. The development, evaluation and comparison of technologies for recovering or destroying cyanide in gold mill effluents.	gold	27.5
6. The characterization of metallurgical sludge stability in disposal systems.	general	27.6
7. The identification , quantifying, testing and application of biological phenomena in the mineral and fossil fuels industries.	general	27.8
8. To elucidate the behaviour of silver in conventional zinc plants nd the development of new technology to improve silver recovery.	silver, zinc	28.13
9. Optimization of unit operations used in placer mining.	gold	29.3
10. Preparation of a manual on the disposal of tailings from uranium mining operations.	uranium	29.6
11. Étude pour nouvelle emplacement d'un parc à rejet.	graphite	39.1
12. Amelioration de la qualité de l'eau recyclee.	niobium	44.3
13. Water management in Noranda Group mills.	general	45.2
14. The use of aquatic animals to monitor and quantify metal environmental contaminants.	general	50.1
15. Rapid dewatering of tailings.	general	50.7

15. TAILINGS / RÉSIDUS cont.

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
16. Classified tailings system.	general	53.7
17. Mill tailings management to control and minimize environmental effects.	uranium	54.4
18. Gold mining effluent treatment.	gold	57.1
19. Treatment of aqueous effluents from in-situ bitumen heavy oil recovery.	oil	57.2
20. Study on abandoned sulphide tailings.	general	73.1
21. Management of tailings piles.	potash	74.5
22. Tailings treatment and control.	gold	79.8
23. Tailings retreatment plant.	gold	82.1
24. Recovery of coal from tailings.	coal	85.7
25. Dust control - pug milling dry mill tailings.	asbestos	91.4
26. Cyanide destruction, effects of hydrogen peroxide and sulphur dioxide on quality of barren solution and slurry.	gold	95.3
27. Treatment of acid mine waters.	general	100.21

16. OTHER / DIVERS

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
1. Bacterial oxidation of methane released from mined coal.	coal	4.2
2. Freeze-proofing coal products with side release agents.	coal	4.6
3. Further processing of antimony concentrates.	antimony	5.2
4. Characterization and recovery of the less common metals from New Brunswick ores and tailings	general	5.4
5. Optimisation de la récuperation de l'or par la cyanuration et la récuperation de l'or nativ.	or	18.1
6. Performance of carbon stripping.	gold	22.8
7. The development of applications for plasma technology as an energy source in pyrometallurgy.	copper	27.3
8. The characterization of the properties of metal-As-O systems and the development of a solid state sulphur probe.	arsenic,S	27.7
9. The development of new or improved processes to increase recovery and reduce costs in treating gold ores.	gold	28.10
10. The development of a process for recovering platium group metals from a Canadian ore.	platium	28.11
11. The development of technology for the recovery and purification of lanthanides and associated metals from a Canadian ore.	rare earths	28.12
12. To elucidate the behaviour of silver in conventional zinc plants nd the development of new technology to improve silver recovery.	silver, zinc	28.13
13. To develop technology to reduce the loss of values to slags and increase the rejection of impurities in smelting.	Ni, Cu,Co,Ag	28.14

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
14. Studies related to asbestos - wet milling, characterization of fibres and bore hole analysis.	asbestos	29.4
15. Production of barium chemicals from barite.	barite	29.7
16. Development of a method for predicting concentrator performance from characteristics of blast hole cuttings.	iron ore	29.8
17. Development of methods to increase fine iron recovery from Wabush/Scully tailings.	iron ore	30.9
18. Mineralogical evaluation of ores.	general	31.15
19. Summary reports, industrial minerals.	ind. min.	31.18
20. Production of cold bonded pellets.	iron ore	31.22
21. Study to determine reducibility of iron ore pellets.	iron	31.23
22. Rendement d'un test de concentration du minerai du lac Rose.	or	32.1
23. Minéragraphie de l'or dans sept échantillons de la propriété Dalembert.	or	32.2
24. Nature de l'or dans un composé de rejet.	or	32.3
25. Etude minéralogique d'un précipité de zinc.	zinc	32.4
26. Les associations minéralogiques de l'or et chalcopyrite dans un minerai de sulfur massif.	or,cuivre	32.5
27. Minéragraphie de l'or: projet Porcupine.	or/arsenic	32.6
28. Minéragraphie du l'or de la propriété Mouska.	or	32.7
29. Étude d'un minerai de cuivre-or.	or,cuivre	32.8
30. Techniques et équipements pour le développement des minéreaux industriels de haute valeur.	ind. min	33.3

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
31. Inventaire de gisements de minéraux industriels du Québec.	ind. min.	33.4
32. Essais standard d'évaluation des charges minérales utlisées dans les secteurs des pâte et papiers et des plastiques.	ind. min.	33.7
33. Évaluation des techniques prometteuses pour le traitement chimique des surfaces des minéraux industriels.	ind. min.	33.8
34. MacRae celestite Loch Lomond, Cape Breton. Concentrate and conversion to strontium carbonate.	celestite	36.1
35. Image analysis on Zn plant wastes.	general	42.5
36. Coal tailings oil agglomeration study.	coal	46.1
37. Hydrometallurgical production of pigment grade zinc oxide.	zinc	50.4
38. Leaching of low-grade minerals with subsequent electrolytic precipitation.	zinc	50.5
39. Abrasion - how to reduce the cost?	general	56.4
40. Application of partial desulfurization roasting to the extractive metallurgy of zinc.	zinc	62.1
41. Metallurgical performance of the Winston Lake mill.	zinc, Cu	65.1
42. Trout Lake ore metallurgy.	Zn,Cu, Au	72.5
43. Industrial minerals survey.	ind. min.	73.7
44. Energy and materials conservation in concrete manufacture and mine backfill.	concrete	73.8
45. Energy conservation in drying and crystalising.	potash	74.6
46. Product quality.	potash	78.10
47. R&D: Reducing power as cyanide consumption monitor.	gold	79.9

PROJECT TITLE TITRE DU PROJET	COMMODITY MATÉRIEL	PAGE.ITEM
48. Integrated agglomeration test facility (IATF).	coal	81.1
49. Development of AGFLOTHERM process for coal, beneficiation and coal heavy oil co-processing.	coal,oil	81.2
50. Arsenic recovery.	arsenic	82.2
51. Coal beneficiation process.	coal	84.1
52. Stabilization of dried coal.	coal	85.2
53. Advanced process for low ranked coal.	coal	85.3
54. Coal preparation and up-grading assistance.	coal	85.4
55. Agglomeration of coking coal.	coal	86.1
56. Recovery of marketable materials from waste products.	mica,zinc	92.4
57. X-ray analysis.	lead,zinc	93.6